

Patent Claims

1. Process for removing a coating from coated substrates, in particular from glass or plastic plates, while preparing the substrates for subsequent uses in which a surface of the substrate which has been at least partially freed of coating is required, with the aid of plasma, wherein in order to locally remove the coating the plasma is directed onto the region of the substrate from which the coating is to be removed, characterized in that plasma, the effective width/area of which corresponds at least to the width/area of the (working) region from which the coating is to be removed, is directed onto the surface of the substrate from which the coating is to be removed, in order to remove the coating on a part-area and/or at least over a part-thickness.
2. Process according to Claim 1, characterized in that plasma is directed onto the glass plate in a row of at least two adjacent, preferably directly adjacent, beams.
3. Process according to Claim 2, characterized in that, in order to change the coverage width of plasma and substrate, at least one plasma beam is deactivated or activated and/or in that an angle of incidence of the row formed by the plasma beams is changed with respect to a direction of advance.
4. Process according to Claim 1, characterized in that plasma from at least one slit-shaped source is directed onto the substrate.
5. Process according to Claim 4, characterized in that, in order to change the coverage width of plasma and substrate, the cross section of the slit-shaped source is

changed and/or the angle of incidence thereof is changed with respect to a direction of advance.

6. Process according to one of the preceding claims, characterized in that a continuous relative movement is brought about between the plasma and the substrate from which the coating is to be removed, wherein a device that emits the plasma is moved relative to the substrate, the substrate is moved relative to the device that emits the plasma or both are moved relative to one another.

7. Process according to one of the preceding claims, characterized in that a relative movement is brought about between the plasma and the substrate parallel to the edge of the substrate from which the coating is to be removed.

8. Process according to one of the preceding claims, characterized in that a row of parallel plasma beams is aligned normal to the edge of the glass plate from which the coating is to be removed, and in that a relative movement in a direction of advance is brought about between the substrate and this row of plasma beams transverse to the latter.

9. Process according to one of the preceding claims, characterized in that a row of plasma beams or a slit nozzle that emits a plasma beam pivots about an axis perpendicular to the glass plate in the region of a corner of a glass plate from which the coating is to be removed.

10. Process according to one of the preceding claims, characterized in that it is used to remove the coating from the edge and/or a face of a substrate.

11. Process according to one of the preceding claims, characterized in that the plasma is also used to remove the

coating from end edges or faces of the substrate, wherein the plasma beams are directed essentially in the normal direction onto the end edges or faces.

12. Process according to one of the preceding claims, characterized in that a flat shield directly adjacent to the respective working region is used, which flat shield is positioned as close to the substrate surface as possible.

13. Process according to Claim 12, characterized in that a shield which surrounds the working region of the plasma in the manner of a frame is used.

14. Process according to one of the preceding claims, characterized in that particles which are detached in the working region are immediately removed by means of a discharge device, in particular a suction device.

15. Process according to one of the preceding claims, characterized in that it is used to remove the coating from regions within the area circumscribed by the edge of the substrate, in particular to remove the coating from so-called communication windows.

16. Process according to one of the preceding claims, characterized in that it is used to remove metal, oxide, nitride or organic coatings or combinations of said layer types.

17. Process according to one of the preceding claims, characterized in that it is used to remove hydrophobic and/or hydrophilic coatings.

18. Apparatus for carrying out the process according to one of the preceding claims, comprising

- a supporting surface (2) for the substrate (4) from which the coating is to be removed,
- a carrier (8) for at least one plasma source (10),
- a device (5) for moving the substrate (4), and
- a device for moving the carrier (8) of the plasma source (10),

characterized in that at least two plasma heads (10) or at least one plasma head with variable cross section are/is arranged on the carrier (8) for the plasma source.

19. Apparatus according to Claim 18, characterized in that the carrier (8) for the plasma head or heads (10) can be moved in front of the supporting surface (2) along an essentially vertical bar (6) by means of a drive.

20. Apparatus according to Claim 19, characterized in that the bar (6) is mounted in the apparatus in a fixed or movable manner.

21. Apparatus according to Claim 19 or 20, characterized in that the carrier (8) for the plasma head or heads (10) can rotate about an axis (16) perpendicular to the plane of the glass plate (4) from which the coating is to be removed.

22. Apparatus according to one of Claims 19 to 21, characterized in that the carrier (8) for the plasma head or heads (10) can be adjusted perpendicular to the plane of the glass plate (4).

23. Apparatus according to Claim 22, characterized in that the carrier (8) for the plasma head or heads (10) is adjustably mounted on a retaining plate (7) guided on the bar (6).

24. Apparatus according to Claim 23, characterized in that the carrier (8) on the retaining plate (7) can pivot about an axis perpendicular to the plane of the glass plate (4).
25. Apparatus according to Claim 23 or 24, characterized in that the carrier (8) on the retaining plate (7) can be adjusted in a linear manner parallel to the plane of the glass plate (4).
26. Apparatus according to one of the preceding apparatus claims, characterized in that the plasma heads (10) are arranged in a row next to one another on the carrier (8).
27. Apparatus according to Claim 26, characterized in that the carrier (8) on the retaining plate (7) can be adjusted in the direction of the row of adjacent plasma heads (10).
28. Apparatus according to one of the preceding apparatus claims, characterized in that a shield (20) is provided in the working region of the plasma heads or in the region where the plasma hits the substrate (4) and the coating (22).
29. Apparatus according to Claim 28, characterized in that the shield (20) surrounds the working region of the plasma in the manner of a frame.
30. Apparatus according to Claim 28 or 29, characterized in that the shield is guided together with the plasma heads.
31. Apparatus according to one of the preceding apparatus claims, characterized in that a device (24) for discharging, in particular for removing by suction, detached particles of the coating (22) is provided in the

working region of the plasma heads or in the region where the plasma hits the substrate (4) and the coating (22).

32. Apparatus according to Claims 28 and 31, characterized in that the device (24) is joined to the shield (20) and is guided together with the latter.

33. Apparatus according to one of the preceding apparatus claims, characterized in that the carrier can pivot about at least one axis parallel to the surface of the substrate in order to deflect the plasma essentially in the normal direction onto an end edge or face of the substrate.